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ABSTRACT

This study examines how the microcomputer could be used in a network with other microcomputers, some established computer technology, and the most recent developments in communication technology. It was also intended to provide information on the feasibility of a provincial communication network between the schools of British Columbia. It was anticipated that with such a network in place, a teacher consultation service between schools could be established and the exchange of quality instructional software packages facilitated. The project consisted of an examination of the communication possibilities between two microcomputers, a mainframe, a community bulletin board system, a database (electronic library), and a knowledge network. The results were that after a number of physical connection difficulties it was possible to use the microcomputer in the conditions under which it was tested; however, high transmission costs were a limiting factor on such a network because of the slow speed of transmission and the current lack of multiple users. A 29-item bibliography is included. (Author/MER)

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THE USE OF MICROCOMPUTERS IN A COMMUNICATION NETWORK

THE COMPUTER USING EDUCATORS OF B.C.

MAY, 1981

BRITISH COLUMBIA, CANADA

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Barry Underwood
Computer Using Educators of B.C.

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I. THE PROJECT

BACKGROUND

In our society today we have a "second" Industrial Revolution - The Technological Revolution. This revolution is affecting every aspect of our society, and while the new technology offers many benefits, in many aspects its effects are devastating.

With the introduction of the microcomputer, the presence of networks such as The Source and MicroNet, the establishment of an educational TV channel via satelite - KNOW, the development of a Videotex system - Telidon, and the potential operation of a computer-messaging system - Envoy 100, there is ever-growing confusion, and the accompanying fear, of this new technology.

The Computer Using Educators of British Columbia (CUEBC) is a Provincial Specialists' Association. Its members have experience with computer technology and are now gathering information on the microcomputer technology. The CUEBC's main objective is to assist in the communication between the educators of B.C., and to provide information on the hardware and the software of the microcomputer technology.

Exchange of information in an area as large and rugged as B.C. is difficult at the best of times, but when it is needed in a large number of individual schools the task is onerous using conventional means. If our schools hope to keep up with the furious advances of the micro technology, then other methods of information exchange will be required.

We are at a time in Canada similar to that of the invention of the internal combustion engine and the resulting automobile. Massive changes will be required as people are forced to reorganize. For the urban planner the questions were: Where do we place bridges, highways, and buildings? For the rural planner the problems were: Do I replace my fourteen horses with one tractor or do I sell my one threshing machine and lay off twenty men and buy a combine that I operate myself? We, too, will be required to make decisions that no other society has had to face.

PURPOSE

The main objective of this study is to examine the ways in which a microcomputer could be used to establish a communication network with other microcomputers, with some of the established technology, and with the most recent developments in communication technology. The information accumulated was aimed at the practitioner so that very little technical information was accumulated.

The study was also intended to provide some preliminary information to the establishment of a communication network between the schools of British Columbia. With such a network in place, a teacher consultation service between schools could be established and the exchange of quality instructional software packages could be facilitated.

II. THE DESIGN OF THE PROJECT

INTRODUCTION

In order to establish communication between two computers, there are a number of factors that need to be considered as well a number of new terms that need to be learned. These factors will be reviewed but in most cases the technolgy is advanced enough so that they are handled automatically. For a reference on the terminology see Appendix E: Modem Glossary.

The characteristics are:

1) Baud Rate - This is the speed at which the computers send or receive data. All systems examined in the study used 300 baud although some modems can work at 9600 baud.

2) Data word length - It may be 7 or 8 bits. In most cases it is 7.

3) Parity Check - Odd, even, or no parity. The signal usually has a start bit, a stop bit, and a parity bit and you normally don't need to make adjustments.

4) Half or full duplex - One way communication like a CB is half duplex. Two way communication like a phone is full duplex. Nothing really to worry about. If you are wrong you will get tthhiiss.

MICROCOMPUTER TO MICROCOMPUTER

To examine communication between microcomputers, two types of test situations were established: Apple to Apple, and Apple to PET. In addition, test sites were situated in Vancouver, Victoria, and Campbell River, so that the effects of long distance charges could be examined.

During a number of test periods, two Apple microcomputers each equipped with the D.C. Hayes micromodem were placed side by side but were connected to separate telephone lines. To the novice, it is not possible to merely connect the two machines directly, as the micromodem requires a carrier tone exchange which was generated by B.C. Tel.. In all test cases, it was predetermined which microcomputer would make the call (originate) and which would receive the call.

For an exchange session, the machine receiving the call would be placed in "answer" mode by the following commands: PR#6 (if disk was desired), PR#3, IN#3, (micromodem card placed in slot 3). The "calling" machine used a software package -Modem Magic- (see Appendix A) and placed a call in the following way: PR#6, chose T, entered the phone #, and waited for carrier signals to be established between the two microcomputers. Once the two machines were "talking" to each other, the caller could send a program, retreive a program, or merely allow for conversation between the two microcomputer terminal operators.

MICROCOMPUTER TO MAINFRAME

In a microcomputer network there is sometimes the need to use a large computer to store large files or to have the large computer act as a "temporary holder" of calls from the microcomputer terminals. For example, a teacher calls the BCTF Lesson Aids Centre and requests information on a topic. The teacher then receives a list of teachers who have done similar projects or obtains immediately the information requested.

The mainframe also possesses capabilities that are not economically possible for an individual district. In the specific area of Computer Studies, a school could not afford to equip itself to demonstate the various computer languages, but it would be possible for it to phone a mainframe and easily illustrate Fortran, Cobol, PL/1, etc..

To access a mainframe computer you require a phone number, an account number, a password, and an understanding of the particular system's idiosyncrasies. This study used the computers at University of Victoria and Camosun as examples of a mainframe.

To illustrate the accessing of a mainframe by a microcomputer, the steps used to communicate with The UVic's computer are given below:

1) Enter T on the Modem Magic menu and type phone #
2) Type P (U Vic's computer responds VM-370 ON LINE)
3) Type LOGON FILE NAME (responds TYPE IN PASSWORD)
4) Enter password (Computer prints a message)
5) Press return (asked to set terminal line width)
6) Type CP TERM LINES 40
7) Connection is now complete and the user must be familiar with the system's protocol.

To learn the University of Victoria's system, a demonstration was obtained from Tom Allen, a systems analyst, and two manuals: The CMS USER's GUIDE and The WATFIV USERS GUIDE were acquired. Appendix B illustrates the type of material that is available on a mainframe. As the purpose was to examine how the microcomputer could be used to provide the user with capabilities of a mainframe, such languages as Fortran and APL were examined as these are very popular languages but are not usually found on a microcomputer.

COMMUNITY BULLETIN BOARD SYSTEM

This system is a volunteer operated system which makes available an electronic mail service for participants. To access this system two types of microcomputers with a modem were established.

A PET with software supplied by CONTI ELECTRONICS was plugged into a TNW 2000 IEEE to RS-232 bidirectional interface, which in turn, was connected to a CAT modem. The TNW 2000 converts from parallel to serial communication, and also compensates for the PET's pseudo ASCII coding system. The modem changes the serial signals into varying audio tones which are picked up by the telephone. The system is bidirectional - tones picked up by the modem are converted to symbols which were printed on the computer screen or on the paper of a printer.

CBBS and a Seattle based "Apple Crates" were tested with an Apple microcomputer and a D.C. Hayes micromodem. Without using the Modem Magic software package, CBBS was contacted in the following manner: PR#0, IN#3 (modem in slot #3), CTRL-A, CTRL-H (half-duplex), CTRL-A, CTRL-Q, and type the phone number. With the Modem Magic diskette, communication was established by placing the disk in the disk drive, typing PR#6, choosing T from the menu, and entering the phone number.

Contact with CBBS was made by dialing the Vancouver number 687-2640 and following the procedures in Appendix C.

THE ELECTRONIC LIBRARY

In Canada and United States, there are a number of microcomputer communication networks, with Source and MicroNet the most widely known. The Source, offered by Source Telecomputing Corp. of America, and MicroNet from CompuServe Corp. were developed as consumer-oriented communications based on telephones. These networks allow the user to run programs that deal with taxes, "chat" to another member, send or receive point to point or multi-point messages (electronic mail), read business reports, play games, and so forth.

This study examined and sampled some of the 400 data bases (an electronic version of a library) on 12 computers available through L.M. Warren Inc. of Vancouver whose services include such tasks as: library management, information storage and retrieval, editorial research, and historical reviews.

To illustrate the use of a data base, DATAPAC was accessed by a Vancouver number and the Hansard Oral Questions data base (HOQ) was requested. This data base is situated on the QL computer in Kingston, Ontario.

Appendix D is an example of the type of information requested and received in a session. Information was received on a topic when one or both of the key words entered were in the file.

KNOWLEDGE NETWORK

Knowledge Network is the provincial education telecommunications authority created in May, 1980, to establish a province-wide telecommunications system using cable, microwave, and Instructional Television Fixed Service transmitters, in addition to the Anik B satellite.

Although the network is developing the services of a Universities Communication System and an Inter-institutional instructional network, the study only explored how microcomputers could be used with the telecommunications network and examined how the microcomputer blends with the TV technology already in place.

Three experimental sessions took place with two investigative days arranged before the March 17, 1981, live presentation. Two models of microcomputers - PET and Apple - were tested with the equipment in the Knowledge Network studio in Burnaby.

The March 17th session was scheduled at 5-7 P.M. so that teachers would have an opportunity to view the program. The format was demonstrations of the educational uses of a microcomputer by Barry Underwood and Harold Brochmann and then questions from the viewers via telephone.

The majority of the picture of the program came via the TV camera, but on occasion the output from the Apple went directly into the Knowledge Network system. No micromodems were used. The communication was a one-way picture and two-way conversation via the telephone.

VIDEOTEX

Basically speaking videotex is two-way television. In a broader sense, it is a two-way information system in which people use a keypad to call information to their TV screen.

The network, built with telephone lines, two-way coxial cable, microwave link, or optical fibre, can be used to: make purchases or reservations, participate in opinion polls, access data bases, send "electronic mail", and much more.

In the world today there has been substantial support for this technology. France recently voted to spend a further $US 23 Billion on the new micro-chip and information technology fields. The UK, which has led the world in both the development and application of videotex, maintains Prestel - the world's one and only one public interactive videotex service. Activity is also high in the U.S.A, Japan, South America, and other European countries.

In Canada, our version of videotex is Telidon. With its comprehensive graphics and a ready-made facility for interactive electronic message transmission, it is considered an advanced video system. In addition, American Telephone and Telegraph recently announced that it is adopting technical standards which will favor the Telidon system. Since AT&T is the world's largest telecommunications company, it appears certain to be one of the most important carriers of two-way TV signals.

With the presence of Telidon in our country, it was our intention to examine whether or not a microcomputer could act as a Telidon terminal. Specifically, we wished to examine whether the Apple could handle the higher-quality graphics and also serve as the keypad. Due to the time limitation on the study, we were unable to set up any testing situations but we are informed that a contract has been signed between Norpak Ltd, - an eastern Canadian firm - and Apple Computer Inc. to develop an "interface card" that would allow an Apple microcomputer to be used as a Telidon terminal.

III. RESULTS AND DISCUSSION

CONNECTION DIFFICULTIES

The D.C. Hayes micromodem was used with the Apple microcomputer rather than an accoustic coupler. The accoustic coupler is the easier of the two to set up as the telephone fits easily into the receiver pads. But the accoustic coupler is not considered as dependable as a micromodem because interference may occur from improper placing of the phone in the receiver pad. In addition, the D.C. Hayes micromodem had a software package - Modem Magic from Rocky Mountain Software - available.

In attempting to connect a microcomputer into the telephone system, it was found that all establishments do not have the USOC-RJ1W or USOC-RJ11C jack (the plug in B.C. Tel puts in the home today). This difficulty was cicumvented by connecting into the telephone wires with an apparatus of two clamps wired to the required plugin. The apparatus was attached to the correct line by dialing 7 (to kill the dial tone) and locating the pair of wires by listening for "the clicks" as the wires were crossed.

Another problem was that in some areas there is no direct distance dialing - the caller is required to give the operator the number to which the call is to be charged. In this situation it was found that an extension phone is necessary.

To place a call with no direct distance dialing to The University of Victoria using an Apple and the D.C. Hayes micromodem, the following procedure was used: PR#0, IN#3, CTRL-A, CTRL-H, CTRL-A, CTRL-Q, and type in the phone number. After typing the last digit, pick up the extension phone and give the charge number to the operator. After a pause (seems like a year) the phone rings once and a beeeeeeeeeeep is heard. Press return (a different tone of beeeeeeeeeeep is emitted) and then hang up the extension. A number of characters usually appeared on the screen caused by the interference created by the hanging up.

INTER-MICRO COMMUNICATION

"Conversation" between two Apples each equipped with a D.C. Hayes micromodem was relatively easy to establish once the Modem Magic software package was acquired. It was found that without such a package it is almost impossible for a new user to establish communication. The micromodem manual has excellent descriptions but the typing in of the programs is far too difficult and time consuming for an inexperienced user.

Software was exchanged following the procedures outlined in Appendix A. It was necessary to prearrange which machine would "call" and which would "answer". It was also found that the Modem Magic software can not be in the "answer" machine. But with the Modem Magic package, it was relatively easy to upload or download programs after a number of sessions, although the package requires that procedures be followed explicitly.

With the Modem Magic software, there were a number of peculiarities that occurred. For example, if a program in the "answer" machine was run from the "call" machine, some commands such as PRINT X,Y did not operate and needed to be replaced by PRINT X; PRINT TAB(10);Y.

Also, if the name of a program that was being transferred contained a CTRL-A, the transfer was interrupted as CTRL-A is a micromodem command.

All three types of programs were transferred - Applesoft, Integer, and Binary. The exchange of software would be considered slow - 15 minutes for a binary file - as the micromodem operates at 300 baud. In addition, it was not always dependable as interference in the line often made the received program one bit out in places.

In addition to the Apple to Apple communication, the Apple to Commodore Pet configuration was tested. Equipped with an acoustic coupler a Commodore Pet machine acted as a remote terminal to the Apple. The Pet also used an RS232 compatible serial interface. No difficulty was encountered with this configuration. The reverse use with the Apple acting as a terminal to a Commodore Pet appeared also possible but the Pet's I/O routines are somewhat more awkward and special programs would have to be developed. It was also felt that transferring actual programs between the two machines would be even more difficult because of the variations in the two different "dialects" of the BASIC language.

REMOTE TERMINAL

It was found that accessing the mainframe was relatively easy, but that using the system to illustrate different types of programming languages requires some expertise. For a person with little or no computer experience, a number of lessons as well as a number of sessions on the system would be required before that person would become competent.

For both mainframes tested - Camosun College and University of Victoria -, it was found that the Apple allowed access to most of the facilities provided to on-line users. In these instances the Apple was functioning as what is often referred to as a "dumb" terminal. The inherent capabilities of the micro were also used by introducing Apple's DOS or disk operating system into the communications link.

By using a program designed for the job (Modem Magic, written by Gary Little, Rocky Mountain Software, Vancouver) output was received from both the Camosun and UVic machines, stored in a buffer and saved to a disk file. In this form it was available as long as necessary and did not depend on the maintenance of the telephone link.

For extremely simple examples of the mode described above see the files "mm.uvic", "mm.camosun" and "mm.teco" in Appendix B. "mm.camosun" and "mm.teco" contain a list of available commands and instructions for using a text editor respectively. Both of these files were taken from the Camosun system. "mm.uvic" was written on the large host machine and then transferred to the Apple's disk. In the case of Camosun College the reverse procedure was also possible.

The file "mm.bfs", in the Appendix B, is an example of a program originally stored on the Apple and transferred to the VAX machine at Camosun, again using the excellent "Modem Magic" program. It is suspected that this same procedure would also be possible with the university machine but the protocols are slightly more complex and this has yet to be tested.

The "uvic" file in the Appendix B contains some dummy "modem delay" lines as the first entry. These were necessitated by an idiosyncracy of "Modem Magic". The sequence for exiting command mode and being able to accept data, while not complex, requires a few seconds to perform. The dummy lines were necessary so that the file proper would not be partially missed. This was a somewhat crude but effective technique.

Mr. Mark Alldritt, one of Mr. Shearman's ex students is now a student and part time employee of Camosun College.

He used an Apple equipped with a serial card and an acoustic coupler to access his accounts at Camosun. The file "mm.apple.com" in the Appendix B is a short program written by Mr. Alldritt and stored on the Camosun system. When executed this in effect tells the mainframe what kind of terminal is on the other end of the communication link. In order for this program to be stored on an Apple disk using "Modem Magic", a more sophisticated technique than the delay lines was used. It was possible to instruct the mainframe to wait for a short time period before executing or listing a program. The 10 second delay used in this case was more than adequate.

A much more difficult and perhaps unsolvable problem was encountered when an attempt was made to use the APL language which is available on UVic's machine. Even with a very rudimentary knowledge of this language, the testing was unsuccessful as some of the vital but exotic ASC II codes required by APL are not available on an Apple.

Another drawback to using a remote terminal with a mainframe is the long distance telephone charges. When the connection was made during school hours for a 1/2 hour demonstration, the cost was a limiting factor on the number of demonstrations. In addition, the teacher required a number of sessions to become familiar with the procedures of the mainframe. Even though these sessions were held in the evening (to reduce the cost), they sometimes cost as high as $15.00. when the sessions were held between Campbell River and Victoria.

ELECTRONIC MAIL

In Appendix C, the results of using the system with a PET are given. Appendix C also contains the outcome of the Apple's communication with bulletin boards. The same hardware and software configuration that allowed the microcomputer user to connect to large database utilities was used to contact the new co-operative community bulletin board systems.

In the case of the bulletin board systems, messages were loaded and retrieved from these computerized community message centres. The files "mm.vancbbs" and "mm.empire" are examples of this activity. These files were produced during sessions with the Vancouver Community Bulletin Board which is a general purpose system for all micro users and with one of the two Seattle based "Apple Crates" or Apple based systems designed for Apple users. The Vancouver message contains a reference to the operation of the D.C. Hayes modem while the Seattle file contains the system greeting message and a plea for help from someone wishing assistance with Apple's new PILOT C.A.I. authoring language. The problem with loss of parts of some of the initial lines of a file can be seen in the Seattle example.

In accessing CBBS with an Apple and micromodem without the Modem Magic software, there were no adjustments required for the data bits and baud rate and the system required half-duplex. But there was a problem of triple letters that occurred when the Apple with the D.C. Hayes micromodem was used without the Modem Magic software. This difficulity was overcome by making the instruction for the output control of the Apple PR#0 not PR#3.

Although CBBS was relatively easy to use, the new user required a copy of the material given in Appendix C to get started. For a new user to merely call CBBS, and access the system without any documentation was extremely difficult. Although the protocol of the system was not impossible to learn, it was found that the most efficient method of learning how to access the system was a demonstration by an experienced user.

The caller could access the data base for the information that he required or leave a message on the system. However, there was very little educational material present in the messages but rather advertisements or personal messages. The CBBS has the potential to be valuable to educators, but only if number of educationanal users were utilizing the system.

DATABASES

Establishing communication with a database was relatively easy if the phone number and the password were known. But it is possible to experience some interference - as with any micromodem communication- and this was illustrated when the HOQ database was accessed. The Appendix D contains an example of such a problem. There were two instances where the computer printed - THERE IS NO DATA BASE followed by OQ or a blank even though HOQ appeared on the paper. It seemed that the signal was not transferred even though the letters appeared on the paper.

Searching the database was extremely easy. For example, the word "microcomputers" was inputted and the computer returned that it did not occur in the data base. For the word "computers", there were nine items in the database which could be accepted or rejected depending on their relevancy.

The cost of using a database was not too restrictive. In the session illustreted in Appendix D, the time on the system was .29 hours and the total charges were $11.45. For a long distance call, the cost would be considerable but in most cases the time spent accessing a database for a particular subject was 4-5 mi

MICRO-KNOW COMPATABILITY

The microcomputer appeared to compliment and blend with the Knowledge Network system, but only after some adjustments. For the PET computer, the picture signal did not match with the signal of the network so that the video output from the PET was not sent directly in the network's system. Instead, a TV camera was used and was able to pickup an adequate picture from the PET's screen.

The Apple's signal also did not provide a clear picture when plugged directly into the network, but this difficulty was overcome by inserting an "interface board"- called the Proc Mod - into slot 7 of the Apple. With the use of this board, the Apple's video signal was adjusted to match that of the Knowledge Network.

The video communication was only one-way, so that the telephone was used to provide the two-way mode. This arrangement was adequate as the program was a demonstration of the educational uses of a microcomputer, but would be inadequate if physical exchange of information were required or two-way video exchange was necessary.

IV. CONCLUSIONS

ADAPTABILITY OF THE MICROCOMPUTER

The microcomputer was tested to determine how it would operate in a variety of networks. It was found that it could be used in a users' network - micro to micro and micro to mainframe, a communications network - CBBS, an information network - Hansard Oral Question database, and a TV network - Knowledge Network. With the successful way in which the microcomputer was adapted to communicate in the number of situations, it was concluded that the microcomputer could become a valuable asset in communication in our educational system.

But for each situation in which the microcomputer was examined, there were specific conclusions drawn. These are as follows:

a) Micro to micro - Programs and messages were easily shared when the model of the microcomputer was the same - Apple to Apple - but difficulties arose when the Apple to PET configuration was set up. To have a successful network, the model of the microcomputer must not be a factor. In addition, the speed and dependability of the sharing were lacking. At only 300 baud, the long distance phone charges were restrictive and the transmission of data was not always complete. For the sending of messages, this standard of exchange was adequate, but for the exchange of programs was inadequate as missed bits made the exchange unsuccessful.

b) Micro to mainframe - The access to a mainframe was relatively easy. This type of exchange allowed the user to examine computing techniques not found on the microcomputer, assemble an immense data base such as a dictionary, and use the mainframe as a source of lessons. But to use the system to its fullest, it was maintained that an experienced person was required and that the microcomputer has limitations on the types of activities it can perform - such as program in APL.

c) Micro and bulletin boards - The microcomputer proved to be excellent in providing "electronic mail".Although messages were easily retreived or left on the bulletin boards, it was concluded that these bulletin boards when used by remote areas did not as yet contain sufficient educational materials to justify the telephone charges.

d) Micro and databases - From the experience with databases, it was concluded that technology was now providing us with not only more information than ever before but with easier access to it. This resource's benefit appeared only limited to the establishment of the appropriate educational databases.

e) Micro and KNOW - To explain a topic to a student the old saying - a picture is worth a thousand words - still remains relative today. The demonstrations of microcomputers on the network, were successful because the viewer received the actual picture of what the machine was doing.

PROVINCIAL EDUCATIONAL NETWORK

Another aim of the project was to obtain information for the establishment of a communication network between the schools of British Columbia. Based on the evidence gathered in the project, it would be absurd to conclude that every classroom, or even every school required a network terminal. But with the evidence gathered on the capabilites of a microcomputer to interact with present-day technology and the new technology, it seemed reasonable to conclude that a network between school districts has merit. With the advent of this technology, there is a growing need to remodel and rethink the ways in which our educational system is organized.

But the use of a microcomputer in a network has as major limitation - the telephone charges. Since the present state of the art of micromodems is to operate slowly -300 baud instead of present limit of 9600 baud -, the cost of communication presently limits the widespread use of networks. This cost factor could be reduced by an increase in transmission speed, a cheaper medium of transfer, or the establishment of a dedicated line. But the cost of a dedicated line could only be justified by multiple uses of a network.

V. IMPLICATIONS OF THE PROJECT

INTRODUCTION

The objective of the study was to determine the use of a microcomputer in a network. Although there were ways in which a microcomputer could be used successfuly in a network, there were a number of factors that could limit the usefulness of such a network. It was necessary , therefore, to consider the ways in which some of these factors could be overcome.

DISCUSSION OF CONCLUSIONS

In the market today, there is an every increasing number of models of microcomputers that do not allow for transfer of programs between them. The study used two types of microcomputers - The PET and the Apple and found the trading of materials difficult. Although with the Z-80 softcard and CP/M the Apple becomes a CP/M based machine, there is very little of compatability between machines. What is needed are "translator" programs that would convert a program to one that the would operate on the required system.

A major restriction to a network was the cost of transmission. This cost could be lowered and therefore more easily justified if multiple uses of a dedicated line took place. It is believed that the uses demonstrated in the study would prove to be a valuable asset to the educational system. With the invasion of the new technology, there is a need to exchange information. The use of an "electronic Mail" service was demonstrated to be beneficial because people could exchange information directly.

Utilizing databases would be another use of a network that could be valuable. For the subject teacher, historical or the most recent information could be readily available. For the administrator, materials on the types of timetables and where they are implemented could be obtained. For the district purchasing agent, textbook information - what books are back ordered and when they are the expected - could be obtained on demand.

A further important use of a dedicated line would be the exchange of quality software. A centralized resource could be established that would allow dissemination of software and accompanying documentation. Such a software bank would make trading of ideas easier as all users would have access. The standard of software could be maintained in this central registry as immediate error detection and correction could be performed.

For instructional purposes, as found in the experiments with the Knowledge Network, and in examining the information on Videotex, a network would be invaluable to educate people in remote areas. More importantly, these media offer "active" education as compared to the "passive" education of TV.

Transmission costs could also be reduced by implementing a network where "downloading" was emphasized. With the present capability of the microcomputer - which is increasing with time - , data or programs could be temporarily loaded into a microcomputer and the cost would be only the time it took to send the information. Once the data or programs were saved in the microcomputer, the user would be accomplishing his "interaction" with a mainframe off line.

LIMITATIONS OF THE PROJECT

The Computer Using Educators of B.C. is a group composed mainly of teachers. To examine the feasibility of a microcomputer network, the effects of distance needed consideration. But in many instances, the dispersement of the people involved in the study made it extremely difficult to coordinate investigations.

The project was only three months long. With the many aspects of a network that were examined, it was felt that more time was required to fully exhaust all potentialities.

The personnel involved in the study were full-time teachers. Although this has the advantage of having people who can test equipment in a "real life" situation rather than a protected laboratory, it also meant that much of the study took place after school hours and on weekends. As there is a limit one's endurance, it was felt that the personnel required some time to work on the project during school hours.

A large variety of equipment was not used in the project. Because of the resources of CUEBC, only two models of microcomputers were used, two mainframes were accessed, and a small number of bulletin boards and databases were contacted. With the immense amount of equipment available today, it was believed that the study could have included a larger examination of existing technology.

SUGGESTIONS FOR FUTURE STUDIES

The investigation into the educational applications of microcomputers and communication links revealed a number of possible uses of a network. With the accumulation of the new information, it is suggested that further examination include:

1. Transfer of programs between microcomputers as an adjunct to inservice programs. (We are planning to test this application during our series of television programs on the Knowledge Network this Fall.)

2. Access by microcomputer and modem to a large database. An example of this application would be the sharing by several schools of information on each other's library holdings. This would facilitate inter-library loans and increase utilization of expensive resources. It would appear to be feasible to use a distributed network of microcomputers for this purpose if one of them was equipped with a large capacity disk storage device.

3. Communication between different models of microcomputers. This was already investigated in a small way with the Pet to Apple experiment noted above and in the future other machines such as the Radio Shack TRS 80 should be included. In addition, the possibility of developing "translators" should be studied.

4. The recent announcement of an agreement between the Apple company and a Canadian firm for the production of interfaces that will allow Apples to be used as Telidon terminals presents another aspect of technology that requires exploration. With Telidon in operation, it appears that a large portion of the educational process could take place in the home. If this was the case, it would seem that future studies should examine this new technology.

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APPENDIX A

MODEM MAGIC DOCUMENTATION

MODEM MAGIC

Version 2.0

DATA COMMUNICATIONS SOFTWARE

for the APPLE II
and the

D.C. HAYES MICROMODEM II

or

APPLE COMMUNICATIONS CARD

by Gary B. Little

DOCUMENTATION

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MODEM MAGIC is distributed by;

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Canada V6B 2R9
(604) 681-3371

INTRODUCTION

The MODEM MAGIC diskette is a package of four programs designed for use with the following microcomputer configuration:

Apple II or Apple II Plus (48K)
Applesoft II in ROM
Disk II operated by DOS 3.3
D.C. Hayes Micromodem II
or an APPLE Communications Card

The programs allow you to easily upload and download text to or from remote computers such as a Computer Bulletin Board System (CBBS), a commercial time-sharing system such as The Source, or another APPLE equipped with a modem.

The main program in the package is called MODEM MAGIC 2.0. It provides for a file buffer which can be filled with up to 28,927 characters of text typed in from the keyboard or received from a remote computer. The text can be edited with a built-in line editor and saved as an ordinary APPLE sequential textfile on a diskette.

Other programs in the package can be used to transfer Applesoft, Integer BASIC, and machine-language programs to textfiles that can then be relayed by MODEM MAGIC to an APPLE or any other computer.

The real usefulness of MODEM MAGIC lies in the fact that text or programs can be prepared for transmission to a remote computer before you have phoned it up and then sent quickly once you have. This cuts down on on-line time and long-distance toll charges to a great extent. In addition, output from a remote computer can be accepted as fast as it can be sent and it can be stored and read later, after you have hung up on the remote computer.

GETTING STARTED

The Micromodem or the Communications Card can be inserted into any slot at the back of the Apple (except slot 0). To get MODEM MAGIC up and RUNning, put the power switch on your APPLE into the off position, insert the MODEM MAGIC diskette into disk drive #1 and then put the power switch back to the on position. At this point, if you are using an APPLE II Plus or an APPLE II with an Autostart ROM chip, the diskette will be automatically booted and MODEM MAGIC will begin to RUN. On older APPLE II systems you will find yourself in the system monitor (indicated by the '*' prompt character) and you must manually boot the diskette. To do this, press 'N' followed by CTRL-P and RETURN, where 'N' is the slot number of your disk drive. CTRL-P means "press the 'P' key while the CTRL key is being held down".

THE COMMANDS

A few seconds after the diskette has been booted a command menu containing twelve commands will be displayed as follows:

```
MODEM MAGIC 2.0:  (C) 1981 GARY LITTLE
COMMAND MENU:

 A)CCEPT MODE          C)OMPRESS FILE

 D)UPLEX SWITCH        E)DIT FILE

 F)ILES AVAILABLE      H)ANG UP

 L)OAD FILE            P)RINT FILE

 Q)UIT PROGRAM         R)ELAY FILE

 S)AVE FILE            T)ERMINAL MODE
ENTER LETTER:
```

To invoke any of these commands, just press the key corresponding to the first character of the command name. A summary of the function of each of the commands follows:

ACCEPT MODE:

ACCEPT MODE allows you to directly enter the mode wherein all text being transmitted by a remote computer to you or being entered by you from the keyboard is stored in the file buffer. To cancel accept mode and return to the command menu, press CTRL-X.

If the file buffer becomes full while you are in accept mode, you will see a 'FILE IS FULL' error message. When this occurs, no further text will be accepted from the remote computer and you must press any key to return to the command menu. If you are using a MICROMODEM, you will see a 'HUNG UP' message if the connection with the remote computer has been lost while you are in accept mode. Again, when this occurs, you must press any key to return to the command menu.

COMPRESS PROGRAM:

COMPRESS allows you to remove all the 'formatting blanks' from an Applesoft or Integer BASIC program that is contained in the file buffer. These blanks are inserted by the BASIC interpreter in order to make a

LISTing of the program easier to read but they are not essential to the RUNning of the program itself. If they are removed before RELAYing the program to a remote computer, the transmission time will be kept to an absolute minimum. Note that when COMPRESSing an Applesoft program, all 'PRINT' statements will be replaced by '?', which is equivalent to 'PRINT'.

DUPLEX SWITCH:

DUPLEX SWITCH allows you to set the duplex mode in which MODEM MAGIC operates. When MODEM MAGIC is first RUN, the duplex is set to 'full'; to switch to 'half', just select this command --- select it again to return to 'full'. The duplex must be set to the duplex mode being used by the remote computer to which you are connected. If you get it wrong, then you will see some odd results while in terminal mode: if MODEM MAGIC is in half duplex and the remote computer is in full duplex everything that you type will be 'doubled' LLIIKKEE TTHHIISS. If MODEM MAGIC is in full duplex and the remote computer is in half duplex, you will not see anything that you type although incoming text will be displayed normally. Note that most large time-sharing systems operate in full duplex mode.

EDIT FILE:

EDIT allows you to add, delete, list, and edit lines of text in the file buffer. The line editor supports four different commands in order to allow you to do this. These commands, and the syntax required to use them, are:

Add:	A linenum
Delete:	D linenum1-linenum2
List:	L linenum1-linenum2
Edit:	E linenum1-linenum2

where 'linenum' represents the number of a line in the file buffer (the line number is displayed in inverse video at the beginning of each line). These commands must be entered from the editor execution mode (indicated by the ':' prompt character). To go from the editor back to the command menu, press CTRL-X while in execution mode. Note that while in the editor the cursor is a blinking 'underline' character.

An explanation of the function of each of the editor commands follows:

A (ADD)
This command allows you to enter new lines of text into the file buffer. The lines will be placed immediately before the line number specified after the 'A' command. If no line number is specified, the line will be added to the end of the file buffer. A line can contain up to 255 characters of text and any CTRL characters in the line will be displayed in flash video. To cancel add mode, press CTRL-X.

D (DELETE)
This command allows you to delete the lines of the file buffer specified in the range. After a deletion, the remaining lines in the file buffer are renumbered sequentially. In order to delete the entire file buffer just enter D-.

L (LIST)
This command allows you to list the lines of the file buffer specified in the range. If no range is specified, the listing will begin with line #1. The listing can be suspended at any time by pressing the space bar. After this has been done, the listing can be stepped through one line at a time by continuing to press the space bar. To resume the uninterrupted listing, press a key other than the space bar. To cancel the listing, press CTRL-X.

E (EDIT)
This command allows you to edit the lines of the file buffer specified in the range. If no range is specified, editing will begin with line #1.

While in edit mode, there are nine functions which can be used:

CTRL-X
This function is used to cancel edit mode and to return to execution mode (indicated by the ':' prompt character).

CTRL-D
This function deletes the blinking character and moves the characters in the line to the right of the cursor one position to the left.

CTRL-H (left-arrow key)
This function moves the cursor one position to the left unless it is already at the first character of the line.

CTRL-I
This function turns on the insertion mode. In insertion mode, subsequent characters entered from the keyboard will be placed in the line before the blinking character. To cancel the insertion mode, press the left-arrow or right-arrow key or stop editing that line by pressing RETURN. Other CTRL characters will also cancel insert mode.

CTRL-M (RETURN key)
This function is used to end the editing of the current line and to go on to the next one in the range. When RETURN is pressed, all characters displayed for the current line will be saved in the file buffer and not just those before the blinking cursor.

CTRL-S
This function moves the cursor 10 spaces to the right, or to the end of the current line, whichever comes first.

CTRL-T
This function truncates the characters after the current cursor position. Only the characters before the cursor will be saved in the file buffer.

CTRL-U (right-arrow key)
This function moves the cursor one position to the right unless it is already at the 255th character of the line.

CTRL-V
This function turns on verbatim mode. When this is done, the next character will be inserted before the blinking character (unless the character selected is ESC or RETURN or CTRL-M). This function is used to insert into a line CTRL characters that normally cannot be inserted because they are editor commands.

UPPER AND LOWER CASE TEXT ENTRY

While in edit or add mode it is possible to enter both upper and lower case characters from the keyboard. The ESC key acts as the shift key: after the ESC key has been pressed, the next character will be displayed as upper case. If two ESC keys are pressed in succession, the upper case shift-lock will be set. To unlock the shift, press ESC once again. Note that when you first enter edit mode, the shift-lock is set.

When you first enter edit mode, all lower case characters will be displayed in inverse video since standard APPLEs do not have the capability of displaying normal lower case. However, if you are using one of the special upper and lower case character generators which are commercially available for the APPLE (such as Paymar's Lower Case Adapter) then you do have the capability and to see the normal lower case characters, just press CTRL-A while in the editor execution mode. If you do not have a lower case generator and you press CTRL-A you will see some rather unexpected characters for your lower case; to return to inverse-video lower case, just press CTRL-A again.

FILES AVAILABLE:

FILES allows you to list all the textfiles that are on the diskette and which can be LOADed into the file buffer. Only textfiles containing the 'MM.' prefix are displayed. Thus if sequential textfiles produced by other software systems are to be used by MODEM MAGIC they should be RENAMEd after they are transferred to the MODEM MAGIC diskette so that their names contain the prefix.

HANG UP:

HANG UP allows you to automatically hang up the MICROMODEM. It has no effect if you are using the Communications Card.

LOAD FILE:

LOAD allows you to load text from a previously saved diskette textfile and to append it to the text already in the file buffer. The name of the textfile to be LOADed must be of the form 'MM.FILENAME' but the 'MM.' prefix the file since the prefix is automatically added to the name specified.

If, while the file is being LOADed, the file buffer becomes full, then the LOADing will be stopped and the remainder of the text in the file will be ignored.

PRINT FILE:

PRINT allows you to send the contents of the file buffer to a printer interfaced to the APPLE. When the PRINT command is invoked, a printer menu will appear on the video screen as follows:

```
PAGE LENGTH (LINES)      :  66
PRINTED LINES/PAGE       :  54
PRINTER SLOT NUMBER      :  1

READY?
```

and the cursor will be positioned on the last line awaiting a response. At this point, the PRINTing can be started by pressing 'Y' or you can return to the command menu by pressing 'N'. To change the values of the three parameters shown, press RETURN; this will move the cursor to the top of the printer menu and you can then begin to enter the values desired for the parameters. By just pressing RETURN when the cursor is opposite the parameter name, the displayed parameter will be accepted.

The page length is the number of lines that a page of your printer paper can hold. If you are using 11-inch paper and the printer is printing 6 lines/inch, then the appropriate value is 66. The lines/page number must be between 1 and the page length value; after this number of lines has been sent to the printer a 'form feed' is issued to bring you to the top of the next page of your paper.

The printer slot number is the number of the slot at the back of the APPLE into which your printer interface card has been inserted. This number can be from one to seven. If you wish to send your output to the video screen instead, choose '0' as the slot number.

QUIT PROGRAM:

QUIT allows you to terminate the RUNning of MODEM MAGIC and to go into Applesoft immediate-execution mode (indicated by the ']' prompt character). To reRUN MODEM MAGIC it is necessary to reboot the diskette by entering PR#N, where 'N' is the slot number of your disk drive.

RELAY FILE:

RELAY allows you to relay the contents of the file buffer to a remote computer with which you have previously established a telephone connection (using the TERMINAL MODE command). If you are using a MICROMODEM and the remote computer has hung up, then MODEM MAGIC will inform you of this fact and, of course, will not allow you to send the file

Before the file buffer is sent, MODEM MAGIC will ask for the prompt character that the other computer supplies after each line of the file buffer is sent. This character will depend on the system to which you are sending. If there is no prompt character used, just press RETURN in response to the query. (See the section below on UPLOADING for more details).

If you are communicating with a remote computer in 'full duplex' mode, which is usually the case, then there are two RELAYing methods which can be used. The default method is the 'FAST' method; when this method is used MODEM MAGIC sends the file buffer as fast as it can and hopes that the receiving computer can keep up with it. The second method is the 'SLOW' method; when this method is selected (by pressing 'Y' after the SLOW METHOD? query), MODEM MAGIC will wait for the receiving computer to return each character before the next character is sent. This method prevents loss of characters but is much slower. Experimentation has shown that the 'FAST' method will work on most systems (including The Source) but if difficulties arise and characters are lost, the 'SLOW' method should be selected.

If you are communicating with a remote computer in 'half duplex' then the only method which can be used is the 'FAST' method.

As the text in the buffer is RELAYed, you will see it displayed on the video screen. If there is a very long pause at any stage of the process, then something unexpected has happened and you should abort by pressing CTRL-X.

Problems in RELAYing text can occur if the wrong prompt character is specified or if the receiving computer has rejected your input for some reason.

When you RELAY the file buffer you should first check to ensure that the number and the length of the lines to be sent to the receiving computer do not exceed the limits set by that remote computer. For example, many CBBS systems will not accept more than sixteen 60-character lines when a message is entered.

SAVE FILE:

SAVE allows you to save the entire contents of the file buffer to a standard sequential textfile called 'MM.FILENAME' where 'FILENAME' is the name that you specify. If the diskette becomes full part way through the SAVE, then only a portion of the file buffer will be saved. If this occurs, you should insert a new INITialized diskette and reSAVE the file.

TERMINAL MODE:

TERMINAL MODE allows you to establish communication with a remote computer at a data transfer rate of 300 baud. Before invoking this command, you should ensure that the DUPLEX SWITCH has been set to the duplex used by the remote computer. In addition, if you are using an acoustic modem that is connected to the Communications Card, you should first ensure that it is switched for 'originate mode' and 'full duplex'.

If you are using a MICROMODEM, then after the TERMINAL MODE command is invoked (and you are not already connected) MODEM MAGIC will ask you to enter a telephone number. At this point you should enter the telephone number of the remote computer. Once a phone number has been provided, the MICROMODEM will dial it and wait for a carrier signal as explained in the MICROMODEM manual. If after 30 seconds the number is busy or there is no answer, MODEM MAGIC will tell you to press any key to return to the command menu.

If you are using a Communications Card, then you will have to establish a connection by dialing the telephone manually and placing the telephone receiver in the acoustic coupler when the carrier signal from the remote computer begins. If you are already connected, however, just press any key to re-enter terminal mode.

Once a connection is made you will be put into terminal mode and you can begin to communicate with the remote computer in the ordinary way.

You can save anything of interest streaming by you while you are in terminal mode by pressing CTRL-X in order to enter accept mode. When this is done, all incoming text will be stored in the file buffer. To cancel accept mode, press CTRL-X; this will return you to the command menu. If you then want to continue to communicate with the remote computer, you can either re-enter terminal mode by pressing 'T' from the command menu (followed, if you are using the Communications Card, by pressing RETURN) or you can re-enter accept mode by pressing 'A' from the command menu.

While in terminal mode you will notice that the annoying 'wrap-around' display effect has been eliminated; this has been done by filtering the input through a special routine that takes a word that is too long to fit on the remainder of the current line and places it at the left side of the next line. This makes it much easier to read incoming text from a remote computer that is geared for video displays that are wider than APPLE's 40-column display.

While in terminal mode (or accept mode), the CTRL-A key acts as toggle to alternatively enable and disable true lower case display When you first enter terminal mode, lower case characters are displayed in inverse video because on most APPLEs lower case characters are not available. However, if you have a special lower case character generator interfaced to your APPLE (such as Paymar's Lower Case Adapter) then you will be able to see the lower case and so true lower case display should be enabled by pressing CTRL-A.

In terminal mode, the ESC key is used as a shift key in the same way as in edit or add mode. It should be noted, however, that if you are communicating with a computer which operates in full duplex and if it automatically converts lower case to upper case (such as another APPLE) then you will not see any lower case characters.

Another special key in terminal mode is CTRL-P. This key behaves in the same manner as the BREAK key which can be found on many terminals

UPLOADING TEXT AND PROGRAMS TO REMOTE COMPUTERS

Applesoft, Integer BASIC, and machine-language programs as well as general text can easily be sent to a remote computer by using MODEM MAGIC commands. This is done by storing the program or text in a diskette textfile and later LOADing it into the MODEM MAGIC file buffer (by using the 'L' command), and then RELAYing it with the 'R' command.

There are three subsidiary programs on the MODEM MAGIC diskette that allow you to transfer an Applesoft, Integer BASIC, or a machine-language program into a textfile suitable for LOADing into MODEM MAGIC. These programs are called FP, INT, and ML, respectively. They can be used by entering Applesoft immediate-execution mode by QUITting MODEM MAGIC.

Transferring Applesoft Programs:

LOAD the desired Applesoft program into memory, insert the MODEM MAGIC diskette and then enter the command EXEC FP. After all the disk activity has stopped, a textfile called MM.BASIC will have been created. This textfile contains the Applesoft program in a format suitable for LOADing into the MODEM MAGIC file buffer.

Transferring Integer BASIC Programs:

LOAD the desired Integer BASIC program into memory, insert the MODEM MAGIC diskette and then enter the command EXEC INT. After all the disk activity has stopped, a textfile called MM.BASIC will have been created. This textfile contains the Integer BASIC program in a format suitable for LOADing into the MODEM MAGIC file buffer.

Transferring Machine-Language Programs:

Insert the MODEM MAGIC diskette and then enter the command RUN ML. At this point, MODEM MAGIC will ask you for the name and the decimal starting address of the machine-language program which you wish to transfer. After this information has been provided, press any key and then wait until MODEM MAGIC asks you to re-insert the MODEM MAGIC diskette. After you do this, press any key. After all the disk activity has stopped, a textfile called MM.CODE will have been created. This textfile contains the machine-language program in a format suitable for LOADing into the MODEM MAGIC buffer.

There are some limitations to the use of the FP and INT programs. Firstly, in order to use them the program which you wish to transfer must be LISTable in the usual manner and so programs with machine-language routines 'wrapped-up' in them cannot be transferred. Secondly, some Integer BASIC programs contain 'illegal' statements within lines which will ultimately cause 'SYNTAX ERROR' messages when they are sent to a remote APPLE. Thirdly, the above procedures destroy line #0 of the program and so you should ensure that the program to be transferred does not use this line number. Fourthly, FP ignores all lines greater than 63999 and INT ignores all lines greater than 32767; these are 'illegal' line numbers in Applesoft and Integer BASIC, respectively.

After programs have been transferred using FP, INT, or ML, the textfile which has been created should be RENAMEd so that it will not be overwritten later when another program is transferred. When renaming the textfile, you should ensure that the 'MM.' prefix is retained; if it is not, the textfile cannot be LOADed into the MODEM MAGIC file buffer.

The Prompt Character:

When a particular program is to be RELAYed to a remote computer, use the 'R' command after the textfile has been LOADed into the MODEM MAGIC file buffer. MODEM MAGIC will then ask for the prompt character that the remote computer will return after each line of the file buffer is sent. This prompt character will depend on the system with which you are communicating. If you are sending to a CBBS then the prompt character involved is probably a question mark ('?'), but not necessarily; the prompt character used depends on the Bulletin Board. If there is no prompt character involved, as when sending MAIL to The Source, just press RETURN when asked to specify the prompt character. If you are sending to another APPLE that is in immediate-execution mode then the prompt character will depend on the type of program that you are sending: ']' for Applesoft, '>' for Integer BASIC, and '*' for machine-language.

EXAMPLE:

To send an APPLE program to a remote computer, first put the program into a textfile by using the FP, INT, or ML program. After this is done, boot the MODEM MAGIC diskette and then use the 'L' command to LOAD the program textfile into the file buffer. At this point you should, if you are sending an Applesoft or Integer BASIC program, use the COMPRESS command to remove all unwanted 'formatting' blanks. After this is done, go to the command menu, press 'T', and then establish connection with the computer to which you wish to send the program. Once a connection has been established and you enter terminal mode, enter the appropriate commands to prepare the remote computer to accept the first line of your program. If the remote computer is another APPLE, then this means putting it into either Applesoft or Integer BASIC mode (it doesn't matter which). If the remote computer is a CBBS, then you must enter the appropriate sequence of commands to get the system ready to accept incoming lines. These commands will depend on the particular CBBS with which you are communicating. After this is done, exit terminal mode by pressing CTRL-X twice. At this stage the MODEM MAGIC command menu should be displayed. To RELAY the program, use the 'R' command and provide the appropriate prompt character as discussed above. After the program has been RELAYed you can press any key to return to the command menu. To re-enter terminal mode in order to continue communicating with the remote computer, press 'T'. At this point the remote computer will have your program in its memory. If you are communicating with an APPLE, you can now SAVE the program to the remote disk system by entering the normal DOS commands.

DOWNLOADING TEXT AND PROGRAMS FROM REMOTE COMPUTERS

Information that is sent by a computer to which you are connected can be trapped and automatically loaded into the MODEM MAGIC file buffer by entering accept mode by pressing 'A' from the command menu or by pressing CTRL-X while in terminal mode.

To interrupt the acceptance of text from a remote computer while in accept mode, just press CTRL-X; this will return you to the command menu.

EXAMPLE:

To receive a program from another APPLE first ensure that it is in 'remote-control' mode and then dial it up using the 'D' command. After a connection has been established and you are put into terminal mode, LOAD the desired program from the remote APPLE's diskette, enter a POKE 33,33 command, and then enter LIST. DO NOT FORGET THE POKE 33,33 COMMAND!! As soon as this is done, the program will be sent to you and in order to save it in the file buffer you must immediately go into accept mode by pressing CTRL-X. If you do not do this quickly enough you may not receive all of the first line of the program. When this is done, the incoming program lines will be automatically placed into the file buffer. After the program has stopped LISTing, return to the command menu, EDIT the file buffer to remove unwanted lines, SAVE the file buffer to a textfile and then re-enter terminal mode to continue communicating with the remote APPLE. Later, you can put the program which you have received into your APPLE's memory by QUITting MODEM MAGIC, entering NEW, and then entering EXEC MM.FILENAME (where FILENAME is the name given to the storage textfile). After this has been done, you can then SAVE the program to any of your diskettes for later use.

MISCELLANEOUS NOTES

1. The left square bracket character ('['), which is normally not available from the APPLE keyboard, can be entered while in terminal mode or in the editor by pressing the CTRL-L key.
2. While you are in terminal and accept mode you will notice that you don't hear the expected 'bell' sound whenever a CTRL-G is received or pressed from the keyboard. The reason for this is that the tone lasts so long that the next two characters sent by a remote computer after a CTRL-G would be lost if the bell were sounded. A special input routine is used to mask out the bell sound but the CTRL-G character itself is retained.
3. If you accidentally press RESET while RUNning MODEM MAGIC, you will, if you are using an APPLE II Plus or an APPLE II with an Autostart ROM chip, stay within the program; however, if you are using an older APPLE II, you will find yourself in the system monitor and it is necessary to reboot the MODEM MAGIC diskette to restart. In addition, a RESET will hang up a MICROMODEM; to recover, just re-dial the number of the remote computer using the TERMINAL MODE command.
4. One final note: DON'T FORGET TO HANG UP ON THE REMOTE COMPUTER WHEN YOU ARE FINISHED WITH IT.

For further information on this program, please contact the author at the following address:

Rocky Mountain Software Inc.
1038 Hamilton Street
Vancouver B.C.
Canada V6B 2R9
(604) 681-3371

APPENDIX B

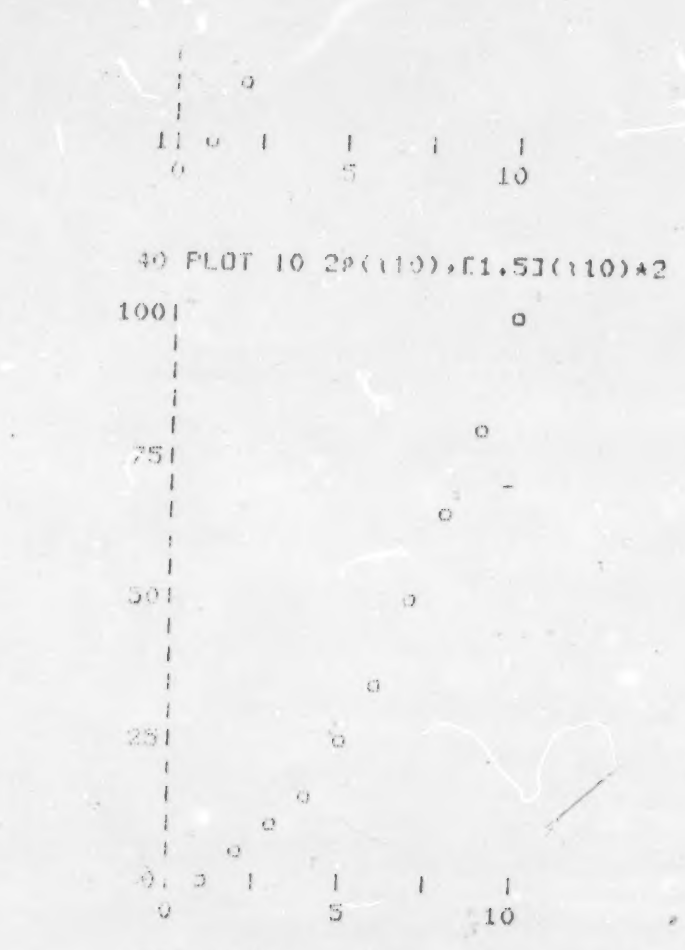
MICRO TO MAINFRAME

```
$ENTRY
EOF;
.top
.down 2
      DO I=1,10
.c/o/o 2/
      DO 2 I=1,10
.t a
$JOB
      DO 2 I=1,10
      PRINT1,I,IXI
1     FORMAT (' ',2I10)
2     CONTINUE
      STOP
      END
$ENTRY
EOF:
.file
R; I=0.08/0.34 12:57:00

.
CMS

.listfile (label
FILENAME FILETYPE  FM  FORMAT  LRECS  BLKS     DATE      TIME   LABEL
FAC      DATA      A1  F  80   1193     47  11/15/80  18:59  U0495A
PROFILE  EXEC      A1  F  80     12      1  11/14/80  17:53  U0495A
FAC      FORTRAN   A1  F  80    306     12  11/15/80  13:59  U0495A
FAC      MANUAL    A1  F  80    460     18  11/05/80  19:12  U0495A
CREATE   OSVS1     A1  F  80    769     31  11/15/80  17:53  U0495A
MANOVA   OSVS1     A1  F  80    714     28  11/01/80  21:30  U0495A
RENAME   OSVS1     A1  F  80     17      1  11/08/80  18:59  U0495A
UNEQUALN OSVS1     A1  F  80     81      4  11/15/80  18:29  U0495A
ANALY    PLI       A1  F  80     23      1  11/01/80  20:47  U0495A
ANALY2   PLI       A1  F  80     14      1  11/01/80  20:39  U0495A
TEST     WATFIV    A1  F  80      9      1  11/17/80  12:57  U0495A
R; I=0.04/0.09 12:58:36

.watfiv test (stupe)
          1          1
          2          4
          3          9
          4         16
          5         25
          6         36
          7         49
          8         64
          9         81
```



```
40 PLOT 10 2^(110),[1.5](110)*2
)OFF HOLD

R; T=1.23/2.42 13:27:14

.e test basic
NEW FILE:
INPUT:
   10 .for i=1 to 5
   20 .print,"barry underwood",i*i
   30 .next i
   40 .end
   50 .
EDIT:
.t :i
   10 FOR I=1 TO 5
   20 PRINT,"CARRY UNDERWOOD",I*I
   30 NEXT I
   40 END
EDIT:
```

```
ALYZE    APPEND     ASSIGN     BASIC      BLISS      CANCEL     CLOSE
   CREATE     DEALLOCATE DEASSIGN   DEBUG      DECK       DEFINE     DE
   DISMOUNT   DUMP       EDIT       EOD        EOJ        ERRORS     EX
   IF         INITIALIZE INQUIRE    JOB        LEXICAL    LIBRARY    LI
   MERGE      MESSAGE    MOUNT      ON         OPEN       PASCAL     PA
   READ       RENAME     REPLY      REQUEST    RMS        RUN        RU
   SPECIFY    START      STOP       SUBMIT     SYMBOLS    SYNCHRONIZE
   WAIT       WRITE

$

-END OF INFORMATION-
```

TEXT FILE MM.UVIC

```
MIS 00:00

MDEM DELAY 4
S    50 REM MODEM DELAY 5
S    60 FOR I = 1 TO 10
S    70 PRINT 'THIS IS A TEST'
S    80 NEXT I
S    90 FOR J = 1 TO 5
S   100 PRINT 'TEST2'
S   110 NEXT J
S   120 PRINT 'THIS IS A TEST OF COMMUNICA
STION BETWEEN VM 370 AND APPLE II'
S   130 END
S
SR;
S
S.Q

-END OF INFORMATION-
```

TEXT FILE: MM.TECO

```
$ TYPE TEST.FIL

  TECO

     TECO INVOKES THE TECO TEXT EDITOR.
  TECO IS AN UNSUPPORTED EDITOR

     CAPABLE OF BOTH BASIC EDITING AND
COMPLEX PROGRAMMED STRING PROCESSING.

     FORMATS

     TECO FILE-SPEC
TO EDIT AN EXISTING FILE

     TECO OUT-FILE-SPEC=IN-FILE-SPEC
TO EDIT FROM ONE FILE TO ANOTHER

     MAKE FILE-SPEC
TO CREATE A NEW FILE

     MUNG CMD-FILE-SPEC
TO EXECUTE A TECO COMMAND FILE

     MUNG CMD-FILE-SPEC,TEXT-ARG
AS ABOVE, BUT PASSES A TEXT ARGUMENT

     AS THESE ARE NOT BUILT-IN DCL COMMA
NDS, YOU NEED TO ENTER

                    TECO :== $SYSSSYSTEM:TECO
TECO

                    MAKE :== $SYSSSYSTEM:TECO
MAKE

                    MUNG :== $SYSSSYSTEM:TECO
MUNG """
```

TEXT FILE: APPLE.COM

```
$ !
$ !  COMMAND PROCEDURE TO SET FOR THE A
PPLE
$ !
$ !
$
$ SET TERMINAL/VT05B/WIDTH=39/CRFILL=2
$ SET MESSAGE/NOIDEN/NOSEV
$
$ DIR :== DIREC/COL=2
$ CAT*ALOG :== DIR/SIZE=ALL
$
$ !
$ !  END OF FILE
$ !
$
$ STOP

$

-END OF INFORMATION-
```

APPENDIX C

COMMUNITY BULLETIN BOARD SYSTEM

TEXT FILE: MM.EMPIRE

WELCOME TO
LE BULLETIN BOARD SYSTEM
APPLE CRATE][

SPONSORED BY THE COMPUTER EMPIRE

616 SW.152ND
SEATTLE, WN. 98166
206-244-5200

FUNCTION:

(A,B,D,E,G,H,K,L,N,Q,R,S,T,V,W,X,?)
(AB) "?" EXPLAINS ?
PPLE PILOT
TO:
AA02/81

I HAVE JUST STARTED WRITING APPLE PILKZVBLLESSONS.
I REALLY LIKE THE PROGRAM BUT I HAVE A PROBLEM I HOPE YOU CAN EL
HELP ME WITH.
DEVELOPING THE GRAPHICS FILES FOR THE LESSONS IS REALLY TEDIOUS
HERE IS THE QUESTION.
CAN I USE SOMETHING LIKE VERSAWRITER OR THE APPLE GRAPHICS TABLE
T
TABLET TO CREATE SUCH FILES
IN OTHER WORDS HOW WOULD I GET SUC
SUCH GRAPHICS INTO THE PILOT PROGRAM.
THANKS BUNCHES.

MSG# TO RETRIEVE (1/77) ?

-END OF INFORMATION-

TEXT FILE: MM.VANCBBS

MSG 02559 IS 03 LINE(S) ON 09-FEB-81 FROM ALLEN MAR
TO GARY EVANS RE: DCHAYES SOFTWARE ON SYSTEM

GARY, IF YOU USE THE "F" FUNCTION ON CBBS, CHECK
OUT THE SOURCE FILES FOR MODEM624.ASM, PLINK715.ASM,
AND A FEW DC HAYES MICROMODEM 100 FILES ON B: DRIVE.

MSG #: TO RETRIEVE (C/R WHEN DONE)?

-END OF INFORMATION-

TEXT FILE: MM.BFS

```
FP

10  REM MACHINE LANGUAGE PROGRAM
20  REM   LOCATION     SCAN
30  REM       BY BRAD FORTH
40  REM            1980
50  TEXT : HOME
60  PRINT "THIS PROGRAM WILL FIND THE LENGTH AND   STARTING ADDRESS OF
70  PRINT : PRINT : PRINT
80  INPUT "PROGRAM'S NAME : ";F$
90 LE =  LEN (F$)
100  FOR N =  LEN (F$) TO 28:F$ = F$ + " ": NEXT
110  DATA  169,44,160,10,32,217,3,96,0,0,1,96
120  DATA  1,0,18,6,32,44,0,32,0,0,1,12
130  DATA  254,96,1,24,32,17,176,56,0,1,239,216
140  FOR N = 11264 TO 11299: READ X
150  POKE N,X: NEXT N
160 T = 17:S = 12
170 SEC = 11279:TRACK = 11278:MEM = 11264
180  POKE TR,T: POKE SEC,S
190  CALL MEM
200  IF  PEEK (8203) = 0 THEN  GOTO 300
210  FOR N = 8204 TO 8448 STEP 35
220  FOR X = 2 TO 30
230 P$ = P$ +  CHR$ ( PEEK (N + X) - 128)
240  NEXT X
250  IF F$ = P$ THEN 310
260 P$ = "": NEXT N
270 S =  PEEK (SEC) - 1
280  GOTO 170
290  REM  LOOK FOR MORE PROGRAMS
300  HOME : PRINT "PROGRAM NOT FOUND !": END
310 T =  PEEK (N - 1):S =  PEEK (N)
320  POKE TRACK,T: POKE SEC,S
330  CALL MEM
340  POKE TRACK, PEEK (8204): POKE SEC, PEEK (8205)
350  CALL MEM
360 S =  PEEK (8193) * 256 +  PEEK (8192)
370 L =  PEEK (8195) * 256 +  PEEK (8194)
380  HOME
390  PRINT "        (NUMBERS  ARE  IN  DECIMAL)"
400  PRINT : PRINT : PRINT
410  PRINT "STARTING RAM ADDRESS :  ";S
420  PRINT : PRINT : PRINT
430  PRINT "PROGRAM LENGTH :  ";L
440  PRINT : PRINT : PRINT "TO COPY THE PROGRAM ,FIRST LOAD IT      ("A
450  PRINT "THEN INSERT AN OTHER DISK (THE ONE TO  RECEIVE THE COPY) ,
460 F$ =  LEFT$ (F$,LE): PRINT
470  PRINT "BSAVE ";F$;",A";S;",L";L
480  PRINT : PRINT "(THEN PRESS RETURN)"
490  END
```

-END OF INFORMATION-

```
¬¬

TODAY'S DATE  16-APR-81    TIME  05:23 P.M.

VANCOUVER, B.C. CANADA
CBBS (R) VERS 3.34  (604) 687-2640


TERMINAL NEED NULLS?  TYPE "N  WHILE THIS TYPES:


*** WELCOME TO VANCOnUVER'S CBBS (R)
*** COMPUTERIZED BULLETIN BOARD SYSTEM (R)


    WITH THANKS FOR SUPPORT FROM:
      THE BYTE SHOP OF VANCOUVER
    AND MICROSTAT @ 4471 WEST 10TH.


CONTROL CHARACTERS ACCEPTED BY THIS SYSTEM:
                   --
ASCII    CTL
CHARS    CHARS
-----    -----
         DEL/ES  CHARACTER DELETE
  C      C       CANCEL OUTPUT
  K      K       FUNCTION ABORT
  N      N       START SENDING 5 NULLS
         R       RETYPES INPUT LINE
  S      S       SUSPEND OUTPUT
         U       LINE DELETE


WHENEVER WE REFER TO "C/R', WE MEAN YOUR "RETURN" KEY!!

----> PRESS "S" TO STOP OUTPUT, "S" TO START IT AGAIN <----
          (NO DATA WILL BE LOST)


SYSTEM MAILING ADDRESS: P.O. BOX 4545  VANCOUVER, B.C. V6E 4A1

----END OF WELCOME----


]--> COMPUTER STORE LISTINGS IN MSG #3
]--> PALS PERIPHERALS PRICES IN MSG #7
]--> MICROSTAT PRICES IN MSG #6

Y/N: IS THIS YOUR FIRST TIME ON THE SYSTEM?nnoo
What is your FIRST name?HHaarroolldd
What is your last name?BBrroocchhmmaannnn
```

```
Logging name to disk...
You are caller # 13397
Next msg # will be 03039
There are  171. active msgs.

Scanning for messages to: BROCHMANN


No messages waiting

FUNCTION: B,C,D,E,F,G,H,I,K,L,M N,P,Q,R,S,T V,W X,#
OR ? IF NOT KNOWN ?ss
First msg #: (or ? for info on scanning msgs)
(C/R to return to menu)?33002200

Use CTL-K to abort, CTL-C to skip, CTL-S to pause.

 NO.  SIZE --DATE--- --------FROM-------- ---------TO---------

03020  06  14-APR-81 JOHN ELEMANS          HEATH USERS
SUBJECT:NEED INFO

03021  05  14-APR-81 ALLAN CORNISH         ALL
SUBJECT:32K PET + DISK + MODEM SALE

03022  07  14-APR-81 BILL KREMER           ALLEN MAR
SUBJECT:HELLO

03023  06  14-APR-81 BILL KREMER           GEORGE CSERENYI
SUBJECT:HELLO

03028  09  15-APR-81 ALLEN MAR             DEREK YEE
SUBJECT:WELCOME DEREK

03035  07  15-APR-81 BILL KREMER           GARY SKETT
SUBJECT:HELLO

03036  07  15-APR-81 BILL KREMER           RICHARD MRAZEK
SUBJECT:HELLO

03037  04  16-APR-8. GARY LITTLE           ALL
SUBJECT:VECTOR GRAPHICS


     ----END OF SUMMARY----
```

```
FUNCTION: B,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W X,#
OR ? IF NOT KNOWN ?//
I DON'T UNDERSTAND '//', HAROLD

FUNCTION: B,C,D,E,F,G,H,I,K,L,M N,P,Q,R,S,T,V,W X,#
OR ? IF NOT KNOWN ???

----FUNCTIONS SUPPORTED----
B=Reprint bulletin
C=Case switch (upper/lower)
D=Duplex switch (echo/no echo)
E=Enter msg into system
F=File transfers (use Help function)
G=Good bye (leave system)
H=Help with functions
I=Initialize first & last names
K=Kill msg from system
L=List a text file
M=Memo left for system operator
N=Nulls: Set as many as req'd (also for CP/M)
P=Prompt switch (BELL on/off)
Q=Quick summary (Msg #, subject)
R=Retrieve msgs by #
S=Summarize msgs
T=Print date, time, elapsed time
V=Video backspace (supports SOL)
W=Reprint welcome
X=Expert user mode
#=Print caller, next msg, # of msgs.

FUNCTION: B,C,D,E,F,G,H,I,K,L,M N,P,Q,R,S,T,V,W,X,#
OR ? IF NOT KNOWN ?rr

MSG #: to retrieve (C/R when done)?33003377

Msg 03037 is 04 line(s) on 16-APR-81 from GARY LITTLE
to ALL re: VECTOR GRAPHICS

Is anyone out there familiar with the
Vector Graphics micro? If so, perhaps
you could leave your comments as
to its quality etc.

MSG #: to retrieve (C/R when done)?hh
++INVALID NUMBER++

MSG #: to retrieve (C/R when done)?
```

```
DUPLEX=Help with system character echoing features.
D=The Duplex (Echo) function.
ECHO=Help with system character echoing features.
BELL=Help with system Prompt (bell on/off) function.
PROMPT=Help with system Prompt (bell on/off) function.
P=The prompt (bell) function
EXPERT=Help with eXpert users mode.
X=The expert mode function
USE=Help with using system efficiently.
TIME=Description of system Time function.
T=The Time function.
#=Types current user, next msg# and number of active msgs.
VIDEO=Help with video backspace function.
BACKSPACE=Help with video backspace function.
V=Video backspace mode function.
TAB=Use of control-I (TAB) characters.
HARDWARE=What hardware makes up the system.
SOFTWARE=What software drives CBBS.
SYSOP=Who runs this CBBS.
WHY=Why does CBBS exist.

Keyword: Enter a single word which best
describes the function you want help on.
Type ? to list all keywords.
Type ?? to list keywords and a BRIEF explanation
?WWHHYY
Use CTL-K to abort HELP
Why does CBBS exist.
CBBS exists thru the generosity of me, (Steve). I am a
computer hobbyist i  erested in sharing my syst   with
all of you just for the fun of the information exchange
and in order to promote communications between hobbyists.

Next keyword: (or press return to end HELP)?

FUNCTION: B,C,D,E,F ',H,I,K,L,M,N,P,Q,R,S,T,V,W ',#
OR ? IF NOT KNOWN ?yy
Comments Y/N: Want to leave any comments or suggestions
?nn
16-APR-81 17:30
Connect time 007 minutes

Character counts:     61 typed by you,     7942 typed by system.
From Steve:
Thanks for calling, HAROLD

++End of connection++
 8|p@
```

In this printout the items printed by me are recognizable by the fact that they are double. This is the result of system echo, and is an optional feature which may activated or disactivated at any time.

APPENDIX D

THE ELECTRONIC LIBRARY

```
!A@(20 BY
6.
DATAPAC: 6710 0024
22100020


DATAPAC: CALL CONNECTED
22100020
QL • IDENTIFIEZ-VOUS SVP • PLEASE SIGN ON:
[redacted]NDERWOOD)HOQ
THERE IS NO DATABASE NAMED OQ .
   PLEASE RE-ENTER THE DATABASE NAME, OR PRESS RETURN OR ENTER
   FOR A LIST OF ALL DATABASES.



HOQ
THERE IS NO DATABASE NAMED
   PLEASE RE-ENTER THE DATABASE NAME, OR PRESS RETURN OR ENTER
   FOR A LIST OF ALL DATABASES.
HOQ
:NTER QUERY (HOQ)
"CAMPBELL RIVER"
/OUR SEARCH IS PROCEEDING.
     RANK      1 OF      2,    PAGE     1 OF     1
•WEDNESDAY, FEBRUARY 2, 1977 14:50
 SEARCH AND RESCUE

 (LATER:)
ALLEGATION A PORTION OF ALLOTTED FUNDS USED FOR NEW OFFICE FACILITIES
- GOVERNMENT POSITION
   MR. HUGH A. ANDERSON (COMOX-ALBERNI): MR. SPEAKER, I HAVE A QUESTION FOR TH
MINISTER OF TRANSPORT. THE GOVERNMENT OF CANADA RECENTLY ANNOUNCED AN
ADDITIONAL $40 MILLION TO BE ALLOCATED FOR INCREASED SEARCH AND RESCUE
FACILITIES IN CANADA FOR THE PERIOD 1977-78. DOCTOR ROBERT SOMMERVILLE, A
COASTGUARD VOLUNTARY RESCUE AGENT FROM•CAMPBELL•RIVER,•B.C., STATED IN A PRESS
RELEASE OF JANUARY 1, 1977:
   WILL THE MINISTER ADVISE THE HOUSE WHETHER THESE ALLEGATIONS ARE CORRECT AN
IF IN FACT ANY OF THESE FUNDS HAVE BEEN ALLOCATED TO OTTAWA FOR RECREATIONAL
PURPOSES?
   HON. OTTO E. LANG (MINISTER OF TRANSPORT): MR. SPEAKER, THE ALLEGATIONS ARE
TOTALLY INCORRECT. NO MONEY HAS BEEN IDENTIFIED IN THE NEW MONEY FOR ANY
ACCOMMODATION IN CONNECTION WITH SEARCH AND RESCUE OFFICES, AND AT NO TIME HAS
THERE BEEN ANY MENTION OF SUCH THINGS AS A SAUNA AND A GYMNASIUM. I HOPE THAT
IN THE FUTURE SUCH PEOPLE WILL OBTAIN FACTS INSTEAD OF MAKING THESE
ACCUSATIONS.
ND OF DOCUMENT.
```

RANK 2 OF 2, PAGE 2 OF 2

HON. ROMEO LEBLANC (MINISTER OF FISHERIES AND OCEANS): MADAM SPEAKER, I DO NOT HAVE IN FRONT OF ME THE ARITHMETIC THE HON. MEMBER REQUESTS. I CAN OBVIOUSLY LOOK AND MAKE SURE THAT HIS OFFICE RECEIVES A COPY. IN FACT, I WAS LOOKING AT THAT INFORMATION IN A REPORT WHICH WAS SENT TO ME LAST NIGHT.
(ENGLISH)

CERTAINLY IT WAS IN AN EFFORT TO BE FAIR TO ALL GROUPS THAT I FELT THAT CONSERVATION MEASURES SHOULD AFFECT ALL GROUPS. THERE SHOULD NOT BE ONE OR TW GROUPS WHICH ARE COMPLETELY EXCLUDED FROM CONSERVATION MEASURES. IN FACT WE HAVE APPROACHED UNITED STATES AUTHORITIES TO EXPLAIN THAT THE SITUATION REGARDING THE FRASER CHINOOK WAS VERY SERIOUS AND THAT WE WERE HOPING THEY WOULD ALSO IMPLEMENT MEASURES TO ACCOMMODATE THE CANADIAN INTERESTS. THEY HAVE NOT REJECTED THIS APPROACH. IN FACT, I THOUGHT THEIR REACTION WAS RATHER POSITIVE. I AM WAITING FOR CONFIRMATION FROM THEM.

END OF DOCUMENT.
S
ENTER QUERY (HOQ)
COMPUTERS & SCHOOLS
YOUR SEARCH IS PROCEEDING.
ZERO DOCUMENTS SATISFY YOUR SEARCH REQUIREMENTS.
ENTER QUERY (HOQ)
MICROCOMPUTER MICROCOMPUTERS TECHNOLOGY
YOUR QUERY:
MICROCOMPUTER MICROCOMPUTERS TECHNOLOGY

THE FOLLOWING WORDS IN YOUR QUERY DO NOT OCCUR IN THIS DATA BASE:

MICROCOMPUTER | MICROCOMPUTERS
TO MODIFY YOUR QUERY, ENTER "M";
TO CONTINUE, PRESS "RETURN" OR "ENTER".
S
ENTER QUERY (HOQ)
COMPUTER COMPUTERS & TECHNOLOGY
YOUR SEARCH IS PROCEEDING.

RANK 1 OF 9, PAGE 1 OF 3
TUESDAY, JUNE 27, 1978 14:27

(ENGLISH)

BUY CANADIAN POLICY
(ENGLISH)

MR. PAUL DICK (LANARK-RENFREW-CARLETON): MR. SPEAKER, A QUESTION TO THE MINISTER OF INDUSTRY, TRADE AND COMMERCE. THE HON. GENTLEMAN'S DEPARTMENT HAS JUST ANNOUNCED A $1.7 MILLION PROGRAM TO ENCOURAGE PEOPLE TO BUY CANADIAN AND THE MINISTER NOW HAS ON HIS DESK A LETTER FROM MR. SHELLMIRE, PRESIDENT OF CONSOLIDATED-COMPUTERS, STATING THAT HIS FIRM IN CONJUNCTION WITH ANOTHER CANADIAN FIRM CAN DO THE JOB WHICH BOTH THE MINISTER OF FITNESS AND AMATEUR SPORT AND THE PRESIDENT OF LOTO CANADA SAID NO CANADIAN FIRM COULD DO, AND DO IT WITH MORE THAN 80 PER CENT CANADIAN CONTENT.
(ENGLISH)

WILL THE MINISTER EXPLORE WAYS TO PREVENT LOTO CANADA EXPORTING HIGH TECHNOLOGY AND EXPERIENCE TO FOREIGN FIRMS, A PROCESS WHICH CAN ONLY WIDEN OU TRADE DEFICIT IN MANUFACTURED GOODS? WILL HE PRESS FOR THIS $23 MILLION CONTRACT TO BE AWARDED TO CANADIAN FIRMS, THUS ENSURING CANADIAN CONTENT AND GIVING SUCH FIRMS AN EDGE WHEN TRYING TO BREAK INTO THE EUROPEAN MARKET FOR THIS TYPE OF EQUIPMENT?
(ENGLISH)

>
JERY, MAXIMUM RANK IS 1 .
IF THIS IS A PHRASE SEARCH, NO FURTHER DOCUMENTS CONTAIN YOUR PHRASE.
TYPE "S" IF YOU WISH TO ENTER A NEW QUERY.
"SPORT FISHING" & REGULATIONS
I DON'T UNDERSTAND.
WHAT DOCUMENT NUMBER DO YOU WANT?
PLEASE TRY AGAIN.
S
ENTER QUERY (HOQ)
"SPORT FISHING" & REGULATIONS
YOUR SEARCH IS PROCEEDING.
RANK 1 OF 3, PAGE 1 OF 1
•THURSDAY, FEBRUARY 20, 1975 15:00

(ENGLISH)
TUNA - DATE OF ANNOUNCEMENT OF•REGULATIONS•FOR•SPORT•FISHING•IN GULF OF ST. LAWRENCE
HON. J. A. MACLEAN (MALPEQUE): MR. SPEAKER, I HAVE A QUESTION FOR THE MINISTER OF STATE FOR FISHERIES RELATING TO TUNA•SPORT•FISHING.•IN LIGHT OF THE URGENCY OF OPERATORS KNOWING WHAT THE POSITION IS GOING TO BE, IS THE MINISTER ABLE TO ANNOUNCE THE FISHERY •REGULATIONS•AS THEY APPLY TO TUNA•SPORT •FISHING•IN THE GULF OF ST. LAWRENCE?
HON. ROMEO LEBLANC (MINISTER OF STATE (FISHERIES)): MR. SPEAKER, I WISH TO THANK THE HON. MEMBER FOR GIVING ME NOTICE OF THIS QUESTION. WE ARE TRYING TO HAVE AS WIDE CONSULTATIONS AS POSSIBLE AND TO RECONCILE THE CONFLICT OF INTEREST BETWEEN THE SPORTS FISHERY AND THE COMMERCIAL FISHERY. WE ARE NOW TRYING TO COME TO A CONSENSUS, AND I HOPE WITHIN THE NEXT 10 OR 15 DAYS TO BE ABLE TO COME DOWN WITH FIRM •REGULATIONS.•
END OF DOCUMENT.

RANK 2 OF 2, PAGE 1 OF 2
•THURSDAY, MARCH 5, 1981 15:00
FISHERIES

(ENGLISH)
IMPACT OR•REGULATIONS•ON•SPORT•FISHING•IN BRITISH COLUMBIA
(ENGLISH)
MR. THOMAS SIDDON (RICHMOND-SOUTH DELTA): MADAM SPEAKER, MY QUESTION IS TO THE MINISTER OF FISHERIES AND OCEANS. IT ARISES OUT OF THE RECENT•REGULATIONS• THE MINISTER HAS ANNOUNCED WHICH IMPACT VERY HEAVILY ON THE SPORTS•FISHING•AND RECREATIONAL COMMUNITY IN BRITISH COLUMBIA, AS THE MINISTER WELL KNOWS BECAUSE OF THE THOUSANDS OF LETTERS HE HAS BEEN RECEIVING. THE MINISTER INITIATED THESE•REGULATIONS •WITHOUT REFERENCE TO THE SPORTS FISH ADVISORY COUNCIL OR TO HIS OWN MINISTERIAL ADVISORY BOARD. HE HAS PRODUCED NO SCIENTIFIC EVIDENCE TO JUSTIFY THE MEASURES HE HAS ANNOUNCED.
(ENGLISH)
AS HE IS A MAN WHO HAS A GREAT DEAL OF REGARD FOR THE CONCEPT OF FAIRNESS AND EQUITY, I WONDER IF THE MINISTER MIGHT TELL THIS HOUSE HOW MANY OF THE FRASER RIVER CHINOOK SALMON ARE CAUGHT BY THE SPORTS FISHERY OF BRITISH COLUMBIA, WHAT PERCENTAGE ARE CAUGHT BY THE INDUSTRIAL SEINE FISHERY, AND WHAT PERCENTAGE ARE CAUGHT BY INTERCEPTION BY U.S. FISHERMEN IN PUGET SOUND AND THE SAN JUAN ISLANDS AREA.
(ENGLISH)

RANK 1 OF 9, PAGE 2 OF 3

HON. JACK H. HORNER (MINISTER OF INDUSTRY, TRADE AND COMMERCE): THE HON. MEMBER IS REALLY ASKING WHAT WE ARE ATTEMPTING TO DO WITH THE $1.7 MILLION. T PURPOSE IS TO INFORM CANADIANS THAT WHEN CANADIAN MANUFACTURED GOODS ARE SUITABLE AND ARE PRICED AS REASONABLY AS IMPORTED GOODS, THEY SHOULD BUY CANADIAN. WE ARE NOT SAYING PEOPLE SHOULD FORGO DOING SOMETHING BECAUSE THE GOODS THEY REQUIRE ARE NOT AVAILABLE IN CANADA. IN THIS CASE, I BELIEVE LOTO CANADA ADVERTISED WIDELY AND ACCEPTED AN OFFER TO DO THE JOB IT WANTED DONE. (ENGLISH)

MR. DICK: THE MINISTER, UNFORTUNATELY, DOES NOT KNOW THAT LOTO CANADA DID NOT ADVERTISE AT ALL; IT ACTED WITHOUT EVEN GOING TO THE CANADIAN INDUSTRY. (ENGLISH)

SOME HON. MEMBERS: OH!

(ENGLISH)

MR. DICK: THE CANADIAN INDUSTRY IS NOW MAD. BOTH ONTARIO AND QUEBEC ARE TURNING TO CANADIAN INDUSTRY AND PROMOTING IT. THE VERY THING THE FEDERAL GOVERNMENT IS TELLING OTHERS TO DO BUT-WILL NOT DO ITSELF. THE PRESIDENT OF T TREASURY BOARD MAY HAVE AN INTEREST IN THIS BECAUSE CONSOLIDATED•COMPUTER•IS OWNED BY THE GOVERNMENT TO THE EXTENT OF 53 PER CENT. HAS HE PROPOSED IN CABINET THAT CANADIAN FIRMS, PARTICULARLY, ONE MIGHT THINK, CANADIAN FIRMS OWNED OR CONTROLLED BY THE GOVERNMENT SHOULD BE GIVEN A FAIR OPPORTUNITY TO ON THIS IMPORTANT CONTRACT?

(ENGLISH)

RANK 1 OF 9, PAGE 3 OF 3

HON. ROBERT K. ANDRAS (PRESIDENT OF THE TREASURY BOARD): WE ARE ALWAYS BIASED IN FAVOUR OF CANADIAN CONTENT AND CANADIAN OPERATORS. I WILL CERTAINL NOTE THE HON. MEMBER'S REPRESENTATIONS.

END OF DOCUMENT.

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FRIDAY, APRIL 10, 1981 11:40

CRIMINAL CODE

(ENGLISH)

UPDATING OF LAW RELATING TO•COMPUTER•CRIME

(ENGLISH)

HON. RAY HNATYSHYN (SASKATOON WEST): MADAM SPEAKER, MY QUESTION IS FOR TH MINISTER OF JUSTICE. WE ARE ALL AWARE OF BOTH THE EXTENT AND THE IMPORTANCE THE•COMPUTER•REVOLUTION IN OUR SOCIETY. WHILE•TECHNOLOGY•HAS EVOLVED SWIFTLY OUR LAWS HAVE REMAINED LARGELY STATIC. IN JULY, 1980, THE SUPREME COURT OF CANADA, IN A CASE CALLED R. V. MCLAUGHLIN, RULED THAT SECTION 287 OF THE CRIMINAL CODE, THE SECTION DEALING WITH THE THEFT OF A TELECOMMUNICATION SERVICE, DID NOT COVER THE UNAUTHORIZED USE OF A•COMPUTER•FACILITY. THE LAW WAS PROVEN TO BE WOEFULLY ANACHRONISTIC. CAN THE MINISTER ADVISE THE HOUSE WHEN WE CAN EXPECT THE INTRODUCTION OF LEGISLATION WHICH WILL BRING THE LAW RESPECTING•COMPUTER•CRIME UP TO DATE?

(ENGLISH)

HON. JEAN CHRETIEN (MINISTER OF JUSTICE AND MINISTER OF STATE FOR SOCIAL DEVELOPMENT): MADAM SPEAKER, THIS IS A VERY IMPORTANT AND DIFFICULT QUESTION WHICH INVOLVES A LOT OF FUNDAMENTAL LEGAL ISSUES. IT IS BEING REVIEWED IN TH DEPARTMENT AT THIS TIME. WE HAVE BEEN IN COMMUNICATION WITH THE CANADIAN BAR ASSOCIATION ON THIS SUBJECT. WE ARE STUDYING THE PROBLEM AT THIS TIME WITH T

RANK 2 OF 9, PAGE 2 OF 2

LAW REFORM COMMISSION, AND HAVE BEEN IN TOUCH WITH THE PROVINCES ON THIS MATTER. IT IS A VERY COMPLEX NEW DEVELOPMENT IN LAW. WE ARE WORKING ON IT. AM NOT IN A POSITION TO TELL THE HOUSE WHEN WE WILL BE READY TO BRING FORWA LEGISLATION ON THE SUBJECT.

(ENGLISH)

MR. HNATYSHYN: AS THE MINISTER WILL KNOW, THE CANADIAN BAR ASSOCIATION H REQUESTED SPEEDY ACTION IN THIS AREA. WILL THE MINISTER COMMIT HIMSELF TO INTRODUCING A SEPARATE BILL WITH RESPECT TO THIS MATTER AT AN EARLY DATE, RATHER THAN WAITING UNTIL THE OMNIBUS BILL ON THE CRIMINAL CODE AMENDMENTS COMES FORWARD AT THE NEXT OPPORTUNITY? WILL HE GIVE SPECIFIC PRIORITY TO TH STUDY SO THAT WE CAN HAVE EARLY LEGISLATION?

(ENGLISH)

MR. CHRETIEN: MADAM SPEAKER, IT WOULD BE VERY HELPFUL IF THE HON. MEMBER WERE TO GUARANTEE SWIFT PASSAGE IN THE HOUSE OF COMMONS. THERE ARE MANY BIL IN FRONT OF THE HOUSE AT THIS TIME AND THEY ARE NOT BEING SENT TO COMMITTEE VERY QUICKLY BECAUSE OF TIME BEING SPENT ON OTHER MATTERS.

END OF DOCUMENT.

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WEDNESDAY, JUNE 28, 1978 14:52

(ENGLISH)

SOURCE OF PROPOSED PURCHASE OF◆COMPUTER◆SYSTEMS

(ENGLISH)

MR. PAUL DICK (LANARK-RENFREW-CARLETON): MR. SPEAKER, I WOULD LIKE TO ADDRESS A QUESTION TO THE MINISTER OF STATE (FITNESS AND AMATEUR SPORT). I A WONDERING, IN RELATION TO LOTO CANADA, WHETX◆

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THURSDAY, JUNE 22, 1978 14:42

(ENGLISH)

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TUESDAY, JUNE 20, 1978 14:17

(ENGLI86

RANK 6 OF 9, PAGE 1 OF 1

TUESDAY, JULY 24, 1973 14:50

ADMINISTRATION OF J◆

RANK 7 OF 9, PAGE 1 OF 2
TUESDAY, FEBRUARY 17, 1981 14:40
THE ENVIRONMENT

(ENGLISH)
ACID RAIN POLLUTION - POSSIBILITY OF COMPENSATION TO FARMERS
(ENGLISH)
MR. JIM FULTON (SKEENA): MADAM SPEAKER, MY QUESTION IS TO THE MINISTER OF THE ENVIRONMENT. I THINK WE KNOW THAT GOVERNMENT AND INDUSTRY INACTION HAS CAUSED THE DEATH OF ABOUT ONE LAKE IN TEN IN ONTARIO. FRIDAY'S BILATERAL INTERIM REPORT MAKES IT CLEAR BEYOND DOUBT THAT CANADA'S AGRICULTURAL SECTOR IS LOSING PRODUCTIVITY AND MONEY BECAUSE OF ACID RAIN, AND I QUOTE BRIEFLY, ''(''PLANT TISSUE LOSS MAY APPROACH 15 TO 30 PER CENT AND YIELD LOSSES OF 5 TO 10 PER CENT MAY OCCUR.'' DOES THE GOVERNMENT PLAN TO COMPENSATE FARMERS IN ONTARIO AND ELSEWHERE IN CANADA FOR THESE LOSSES?
(ENGLISH)
HON. JOHN ROBERTS (MINISTER OF STATE FOR SCIENCE AND TECHNOLOGY AND MINISTER OF THE ENVIRONMENT): MADAM SPEAKER, OF COURSE WE ARE VERY PLEASED THAT THE INTERIM REPORT HAS COME FORWARD SO QUICKLY AND IT HAS CONFIRMED THE VERY REAL AND URGENT PRESSING DANGERS WHICH WE HAVE PREVIOUSLY DESCRIBED. FURTHER WORK IS CONTINUING AND, AS THE HON. MEMBER KNOWS, WE EXPECT FURTHER REPORTS IN JUNE AND A RAPID CONCLUSION OF THE INITIAL STAGES OF NEGOTIATIONS WITH THE AMERICANS. HOWEVER, THE QUESTION OF COMPENSATION TO SPECIFIC PEOPLE

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AFFECTED BY THIS GENERAL PROBLEM IS NOT ONE ON WHICH WE HAVE YET MADE A DETERMINATION.
(ENGLISH)
MR. FULTON: WELL, MADAM SPEAKER, SINCE 50 PER CENT OF THE ACID RAIN FALLIN IN CANADA IS FROM CANADIAN SOURCES, AND THE FACTS ARE CLEAR BEYOND DOUBT THAT INDUSTRY IS PROFITING BY NOT INSTALLING AVAILABLE REDUCTION TECHNOLOGIES, IS IT THE MINISTER'S POSITION THAT INDUSTRIAL POLLUTION PROFIT IS MORE IMPORTANT THAN CROP YIELD IN CANADA?
(ENGLISH)
MR. ROBERTS: NO, MADAM SPEAKER, THAT IS NOT A FAIR DESCRIPTION OF THE POSITION. THERE IS STILL MUCH WORK TO BE DONE TO TRACE SPECIFIC CONSEQUENCES OF SPECIFIC POLLUTING SOURCES. A GREAT DEAL OF WORK HAS BEEN DONE IN THAT WAY AND THE MODELS WHICH ARE BEING BROUGHT FORWARD BY COMPUTER ANALYSIS ARE BEGINNING TO CONVERGE, BUT THERE IS NOT YET AN ASSURED WAY OF DETERMINING HOW AN INITIAL POLLUTING SOURCE AFFECTS WHAT PARTICULAR PLACE OF DEPOSITION.
END OF DOCUMENT.
8
RANK 8 OF 9. PAGE 1 OF 2
MONDAY, MAY 8, 1978 14:32

(@ENGLISH)
RANK 9 OF 9, PAGE 1 OF 1
TUESDAY, MAY 10, 1977 14:30

(ENGLISH)
SUGGESTED REVIEW OF TARIFF BOARD REPORT ON◆COMPUTER◆INDUSTRY
(ENGLISH)
MR. SINCLAIR STEVENS (YORK-SIMCOE): MR. SPEAKER, MAY I DIRECT MY FINAL SUPPLEMENTARY QUESTION TO THE MINISTER OF STATE FOR SCIENCE AND◆TECHNOLOGY?◆AS THE UNEMPLOYMENT SITUATION IS UNDOUBTEDLY PARTLY TO BE BLAMED ON THE LACK OF PRODUCTIVITY IN CANADIAN INDUSTRY, AND AS CANADIAN PRODUCTIVITY GAINS WERE LITERALLY THE LOWEST AMONG THE SEVEN COUNTRIES ATTENDING THE LONDON CONFERENCE WOULD THE MINISTER INDICATE IF HE HAS REVIEWED THIS DRAGGING OF CANADIAN PRODUCTIVITY GAINS, TO DETERMINE WHY WE ARE FALTERING SO BADLY? SPECIFICALLY, HAS HE REVIEWED THE TARIFF BOARD REPORT OF THE◆COMPUTER◆INDUSTRY, WHICH HAS
RE6
RANK 6 OF 9, PAGE 1 OF 1
TUESDAY, JULY 24, 1973 14:50
ADMINISTRATION OF JUSTICE

(LATER:)
USE OF CENTRAL POLICE◆COMPUTER ◆ STEPS TO PROTECT CIVIL LIBERTIES
MR. RON ATKEY (ST. PAUL'S): MR. SPEAKER, I HAVE A QUESTION FOR THE SOLICITO GENERAL. CAN HE TELL THE HOUSE WHEN THE NEW CENTRAL POLICE◆COMPUTER◆WILL BE ON LINE WITH THE CAPACITY TO PROVIDE◆COMPUTER◆ASSITED INTERROGATION AND INVESTIGATION SIMILAR TO THAT BEING USED IN THE U.S. SENATE WATERGATE INQUIRY, AND WHAT STEPS HAVE BEEN TAKEN TO PROTECT THE CIVIL LIBERTIES OF CANADIANS WHO ARE SUBJECT TO APPLICATIONS OF THIS NEW◆TECHNOLOGY?◆
HON. WARREN ALLMAND (SOLICITOR GENERAL): MR. SPEAKER, I WILL HAVE TO TAKE NOTICE OF THIS QUESTION. WE HAVE INFORMATION THAT THE◆COMPUTER◆WILL NOT DO ALL THE THINGS REFERRED TO BY THE HON. MEMBER, BUT I WILL GET A COMPLETE REPORT AN PROVIDE HIM WITH IT.
END OF DOCUMENT.
TOT
QL ACCOUNTING REPORT FOR UNDERWOOD
SIGNED ON AT 13:26:31

TIME ON: 05/07/81
0.29 HOURS

DATAPAC CONNECT TIME CHARGE		$ 1.45
COPYRIGHT ROYALTIES DUE		NIL
SIGNON CHARGES:	1 SIGNON	$ 2.00
SEARCH CHARGES:	4 SEARCHES	$ 8.00
TOTAL CHARGES (NOT INCLUDING PRINT REQUESTS)		$11.45

PLEASE PRESS RETURN OR ENTER TO CONTINUE
OFF
SIGNOFF REQUEST ACCEPTED.

DATAPAC: CALL CLEARED - REMOTE REQUEST

APPENDIX E

MODEM GLOSSARY

ACCOUSTIC COUPLER - A type of modem that uses a normal phone. The phone is placed in a receiver pad after the number has been dialed.

ASYNCHRONOUS TRANSMISSION - Each character transmitted has its own start and stop bits. This is the most commonly used method.

BAUD - The speed of data transmission (how fast the signals move between the computers)

CARRIER SIGNAL - A signal that contains no information by itself but whose characteristics can be altered to carry data.

FULL DUPLEX - Data is transmitted simultaneously in both directions - a phone conversation.

HALF-DUPLEX - Data is transmitted in either direction but not simultaneously - a CB radio.

MAINFRAME - A term used to describe a large computer as compared to a microcomputer.

MODEM - A device used at each end of a telephone line to convert binary data to audio tones and vice versa - an ancronymn for MOdulator and DEModulator.

MODULATION - The process of altering tone, volume, or rhythm of a carrier signal to convey information.

ORIGINATE/ANSWER - Two modes of operation for a modem. In the "originate" mode, the modem will utilize one set of frequencies to transmit data and another set to receive data. In the "answer" mode, these frequencies are reversed.

PHASE MODULATION - A method of transferring data via a modem in which the rhythm of a carrier signal is altered to represent digital 0's and 1's.

START/STOP BITS - Bits used in asynchronous transmission before and after a block of letters. Their purpose is to warn the receiving computer to expect data and to signal the end of the block of data.

SYNCHRONOUS TRANSMISSION - Data transmission in which the bits are transmitted at a fixed or timed rate.